TALON SERIES USER GUIDE

Castle

IMPORTANT WARNINGS

- Castle Creations is not responsible for your use of this product or for any damage or injuries you may cause or sustain as a result of its usage.
- Castle controllers are for use by adults only.
- Always remove the propeller or pinion when working on a power system with the battery connected.
- Please observe all local laws regarding the flying of remote control aircraft.
- Never fly over others or near crowds.
- An RC vehicle crash or a power system malfunction may result in fire. Never operate RC vehicles in a flammable environment, such as around dry vegetation.

HOW TO CONNECT YOUR TALON

1. Add Your Battery Connector

You must solder a quality battery connector of your choice to the red (+) and black (-) power wires. Solder the battery connector to the wires. **ENSURE THAT THE POLARITY IS CORRECT (red wire to battery red wire, black wire to battery black wire).** Follow the instructions provided with the battery connector.

2. Connect The Motor To Your ESC

Solder Castle male bullet connectors to the motor and Castle female connectors (barrel) to the motor leads attached to the ESC. Connect the motor to the ESC by pushing the bullet connectors into the barrels, swap any two connections to reverse the rotation of the motor.

3. Connect The ESC To Your Receiver

Connect the receiver lead to the throttle channel on your receiver.

Note to users with external receiver/radio power supply: Always disconnect the red power wire on the throttle lead if an external BEC or battery is employed in the radio/servo circuit.

Note to users with a Futaba transmitter: You must reverse the throttle channel signal on your transmitter. Please refer to your Futaba instructions and exercise extreme caution when first powering your ESC.

OPERATION

The Castle Talon ESC will not provide power to the motor when first powered up. The ESC must receive a low throttle signal to arm.
Follow this initialization sequence to operate the motor.

1. Turn your transmitter ON and set the throttle stick to mid throttle.

2. If you are using an external BEC or radio battery and your red power wire on the throttle lead is disconnected, power the radio receiver in the RC vehicle.

3. Connect the main power battery to the speed controller. The ESC will make a chime and then a sequence of beeps. Count the number of beeps and make sure it matches the number of LiPo cells that were plugged into the unit.* The speed controller will remain disarmed and will not operate the motor until it receives the zero throttle command from the receiver.

4. When you are ready to fly, move the throttle stick to the lowest position on your transmitter.

5. The Talon will play the arming tone through the motor to indicate that it is armed.

*If the ESC does not count the correct number of cells, as indicated by the beeps, then your cutoff voltage will NOT work. Do NOT fly. First, ensure your battery is fully charged. If the problem persists please contact customer support.

Note: if auto-calibrate throttle (default throttle setting) is selected, always restrain vehicle and run throttle to full power prior to flight to allow ESC to recognize the full throttle signal.
Note: Always power your radio transmitter before powering up the receiver and/or the ESC. Some receivers with failsafe features or receiver units that are not bound on receiver power up are entirely capable of causing the arming sequence to occur and command the ESC to drive the motor. Always keep the aircraft restrained and clear of body parts when the ESC is powered.

Always perform a range check at full, half, and zero throttle before flying with any new speed controller!

TALON ESC PROGRAMMABLE FEATURES

Talon ESCs offer a wide array of operating modes and settings for helicopter, multi-rotor, and fixed wing vehicles. These settings are most readily accessed using the Castle Link USB adapter (coupon for free Castle Link USB adapter is included with the Talon ESC) and Castle Link User Interface software available at no charge at castlecreations.com/downloads.

TALON ESC STICK PROGRAMMING

You may change the following settings using your transmitter and receiver.
Low Voltage Cutoff Value

ESC optionally stops or ramps down the motor power when the input battery voltage drops to the programmed cutoff voltage per cell. Values include, 3.0, 3.1, 3.2, 3.3, 3.4 volts per cell or NONE.

Brake

ESC optionally stops rotation of the motor when the throttle signal is moved to the lowest position. Values include soft delayed brake, hard delayed brake, soft immediate brake, hard immediate brake, and brake disabled.
Low Voltage Cutoff Type

Select the method of cutoff employed by the Talon when the low voltage set in #1 is reached. Options are hard cutoff, soft cutoff, RPM decrease, and pulsing RPM.
PWM Settings

Choose a PWM rate that best suits your motor. Options are 8 kHz, 12 kHz, or 16 kHz.

MANUALLY CHANGING PROGRAMMABLE SETTINGS

The Talon ESC software is designed to make it difficult to accidentally enter programming mode. Once in programming mode, the Talon ESC "asks" questions by beeping and flashing the setting number, followed by the number for each of the setting values. You must answer "yes" or "no" by moving the throttle stick on your transmitter to each of the setting values as the Talon ESC presents them. The values are always presented in sequence. This method does NOT "tell you" what any of the settings are currently programmed for.

The current setting and setting value are "flashed" out by the LED. (For example if you are on setting #3 and value #2, there will be 3 beeps/flashes, then 2 beeps/flashes repeating until you answer). Answering "no" to a setting value will cause the Talon ESC to ask for the next value in sequence. Answering "yes" to a setting value will store that setting in the permanent memory, and skip to the next setting.

NOTE: If you answer "no" to all values for a particular setting, the ESC will keep whatever value had been previously programmed. Only by answering "yes" to a value will the Talon ESC store/change any value.

You will need to move the transmitter stick to the "yes" (full throttle) position or the "no" (zero throttle) position to answer the question. When the Talon ESC has accepted your answer, it will flash the LED rapidly, and emit a constant beeping. Move the throttle stick back to the middle position for the next question.

After you have verified that the controller works properly, follow the steps below to change settings.

If you only wish to change some of the settings you do not need to continue

through the programming steps for the remaining settings. To exit stick programming mode at any point, disconnect battery power, re-connect power, and arm the speed control as normal.

ENTER PROGRAMMING MODE

1. The Talon ESC must be connected to a motor in order for you to hear the programming beeps. Turn your transmitter on, and leave the Talon ESC unpowered. Move the transmitter stick to the top position (full throttle).

2. Connect a motor battery to the Talon ESC and the ESC will sound its initialization tones. After a short period of time the Talon ESC will sound another short tone and the LED will flash a short, single flash that repeats. *NOTE: If the ESC flashes continuously it is not seeing a full throttle position. Move your throttle trim to the top position or increase your full throttle endpoint or ATV on your transmitter.*

3. Move your transmitter stick to the middle position. The ESC will sound another short tone, and the LED will flash a short, double flash that repeats.

4. Move your transmitter stick back to the top position again. After a short time, the ESC will sound a short tone, and the LED will flash a short, triple flash that repeats.

5. Move your transmitter stick back to the middle position again. The ESC will sound four short tones in a row, and the LED will start a repetitive flash sequence consisting of a single flash, a pause, another single flash, followed by another pause.

The ESC is now in programming mode and asking you if you would like to set the first option (Low Voltage Cutoff) to the first value (3.0V). Enter your settings using the method described on the other side.

Setting 1: Auto-LiPo volts/cell cutoff*

NOTE: When setting LiPo cutoff voltage, always follow your battery brand recommendations.

Option	Value	Recommended Use
1	3.0V per cell	
2	3.1V per cell	
3	3.2V per cell	**FACTORY setting**
4	3.3V per cell	
5	3.4V per cell	
6	DISABLED	Controller will NOT shut down motor at any voltage.

*Refer to cell vendor's instructions for cutoff voltage.

Setting 2: Brake Type

Option	Value	Recommended Use
1	Soft Delayed Brake	General aircraft use, with fixed or folding prop.
2	Hard Delayed Brake	Direct drive applications where more braking power is required.
3	Soft Brake – No Delay	Competition use where a very short brake delay is required.
4	Hard Brake– No Delay	Competition use where a very short brake delay is required. Brake action may be very abrupt. *Be very cautious with high-powered setups.*
5	Brake Disabled	Helicopters, 3D airplanes, and by choice, on most aerobatic airplanes. **FACTORY setting.**

Setting 3: Low Voltage Cutoff Type

Option	Value	Recommended Use
1	Hard Cutoff	Will shut the motor off when the programmed cutoff voltage is reached. The motor may be restarted by lowering the throttle to the brake position, and re-arming. For gliders and some parkflyers where a "motor off" situation does not put the model in danger.
2	Soft Cutoff	ESC ramps down the throttle to safely maintain the battery voltage at the programmed cutoff level. Very useful for 3D flying, indoor flying, all helicopters, and most any sport flying where you do not want the motor to turn off when the low voltage cutoff is reached. **FACTORY setting.**
3	RPM decrease	ESC reduces RPM dramatically.
4	Pulsing RPM	ESC pulses throttle

Note: Options 3 and 4 will give a warning that the battery pack is below the preset low voltage level. The ESC will allow the user to run the motor without additional action. The user is responsible for stopping further discharge of the battery.

Setting 4: PWM Switching Rate**

Option	Value	Recommended Use
1	8kHz	Suggested for most Scorpion outrunners.
2	12 kHz	Recommended for most brushless motors. **FACTORY setting.**
3	16 kHz	Recommended for low inductance motors. RARE. Suggested for Kontronik Tango motors.

**Refer to motor manufacturer's instructions for frequency settings.

CONTACT AND WARRANTY INFO

Your Talon ESC is warranted for one year* from date of purchase to be free from manufacturing and component defects. This warranty does not cover abuse, neglect, or damage due to incorrect wiring, over voltage, or overloading. If you have any questions, comments, or wish to return your ESC for warranty or non-warranty repair or replacement, contact Castle Creations, Inc. at:

Phone: (913) 390-6939
540 North Rogers Road
Olathe, Kansas 66062 USA
www.castlecreations.com

*You may have additional warranty rights under the laws of certain nations or states.

NON-WARRANTY REPAIRS

Never throw away a damaged Castle product! You may send it to Castle and take advantage of our flat price replacement offer. Please check our website for specific pricing.

TALON ESC OPERATIONAL TONES AND ERROR CODES

Tone	Talon LED	Meaning	Description
Castle power tune with beeps corresponding to number of cells	Blinks out cell-counts with **RED LED**	Power up notice	ESC plays Castle signature tone and beeps out the number of cells attached to controller. Note: when Auto-LiPo detect is disabled by the user, ESC will not beep the number of cells. ESC will not run motor until it receives an arming signal from radio via the throttle lead.
Arming tune	N/A	ESC ready to run motor	ESC plays the Castle arming tone once it receives a low throttle signal from the receiver. Controller is ready to run the motor at this point.
●	**RED LED** matches tones	Powered ESC notice	ESC beeps motor every 10 seconds to remind user that power is connected to the ESC. This notice may be disabled in Castle Link.
● —	**RED LED** matches tones	Low voltage cutoff	Main battery voltage dropped below the cutoff value. Default is Auto-LiPo which generates a value using 3.2V times the detected cell count. Other settings may be entered in Castle Link.
● — ●	**RED LED** matches tones	Over temperature	ESC reached an overtemp condition when operated under too high a load, operated without proper cooling airflow, or when operated at partial throttle (40%-99%) with too large a load.
● — —	**RED LED** matches tones	Excessive load	ESC detected very high current spikes. Causes may include damaged wiring leading to or in the motor, or the use of too large a motor for the controller.
● ●	**RED LED** matches tones	Start fail	ESC was unable to start motor
● ● —	**RED LED** matches tones	Radio glitch	ESC detected unusual signals or loss of signal on throttle wire.
● ● ●	**RED LED** matches tones	Motor anomaly	ESC detected a sudden mechanical interruption of the motor's rotation.
— ●	**RED LED** matches tones	Over-current	ESC detected operating currents that exceed the current rating of the ESC.
— ● —	**Red LED** matches tones	BEC over temperature	ESC has detected that the integrated BEC is overheating due to current draw above the ratting of the BEC.
None	Flashing **GREEN LED**	Locked head speed	Governor mode has locked the head speed.
None	**SOLID RED**	Full throttle	ESC is at full throttle.

KEY
● = SHORT TONE
— = LONG TONE